Chapter 20

THE IMPORTANCE OF SOCIO-CULTURAL DIFFERENCES AND OF PATHWAY ANALYSIS FOR UNDERSTANDING LOCAL ACTORS' RESPONSES

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Abstract: The enormous diversity of responses to the drought conditions in the last thirty years makes it difficult to formulate general conclusions about people's responses to climate change. It is important to study the pathways of decision-making units at the micro-level and even at individual level and to emphasize the socio-economic differences in changing patterns of responses and the gradual changes in people's 'habitus'. To understand the options available to people it is wise to focus on the technological changes in land use, the changes in the control over resources, migration and mobility, the trends of livelihood diversification and institutional change

1. CLIMATE VARIABILITY

The climate in the Sahel with its low and erratic rainfall is the main problem farmers and livestock keepers have to deal with. The amount of precipitation, rather than its distribution in time and space, is the main structuring factor for decisions with respect to the use and management of natural resources and the allocation of labour (Mortimore & Adams 1999).

Risks resulting from climate variability have an impact that goes far beyond the domain of agricultural production alone. Given the enormous fluctuations in agricultural production, market prices react sharply to rainfall variability and even magnify its effects (Swift 1986, Hesse 1987, Davies 1996). However, climate variability is not the only important factor in decision-making. A whole range of exogenous factors (international markets, international and national policies related to

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agricultural development, laws) needs to be addressed to analyse local-level strategies aimed at dealing with climate change. Obviously, these high risks have an impact on the way in which people organise their lives. It has been shown that in the Sahel livelihood strategies, laws and institutions, moral codes, social security mechanisms, rituals and understandings of their environment have emerged out of the interaction between local actors and their environment while handling these high risks. Global circulation models predict greater aridity in parts of the Sahel, implying that the variability and unpredictability in the timing and spacing of rainfall will also increase (Dietz *et al.* 2001, Van den Born *et al.* 2000). This will make it even more difficult for local actors than at present.

The high risks at stake compel people to adjust constantly to variable conditions of all sorts and to preserve a large degree of flexibility. The strategies that local people have developed over the years are the result of their interaction with climatic conditions and other contingent factors and the sequential adjustments they have made. The key to an understanding of the strategies people develop under conditions of climate variability is to focus on the daily decisions they take to mitigate climate variability and a host of other factors to ensure their subsistence and survival. This approach also allows a better appreciation of the role of individual differences in resource endowments and in social and cultural backgrounds in moulding the distinct paths actors seem to follow under high-risk conditions.

An important part of the research effort within the ICCD project was thus devoted to an investigation of the role of socio-cultural differences for the understanding of the evolution of specific pathways followed by local actors to mitigate climate variability and climate change. After a short introduction to the ways in which the research was executed (Section Two), we focus on the methodological aspects (Section Three) and the results of the analysis of local-level responses based on field research conducted within the framework of the ICCD project and earlier research by the authors and others (Section Four). This is done in relation to contextual factors and climate variability. We also examine the significance of socio-cultural differences in explaining the reasons for choosing specific responses and their relation to climate change scenarios and modelling exercises (Section Five).

2. INVESTIGATING DIFFERENCES

2.1 Methodologies for Investigating Differences

Broadly speaking there are two strategies for investigating socio-cultural differences in relation to actors' responses to climate variability

and climate change. The first involves formulating hypotheses and investigating these by means of a statistical analysis of a broad range of qualitative and quantitative data in relation to each other, to see whether these cluster and whether they indicate specific responses. The second method is more inductive and is based on focused fieldwork leading to the description of responses and an in-depth analysis of these responses compared with a broad range of contextual factors. Both methods have specific advantages and disadvantages as is shown by Chapters 9 and 16, which all lean more towards the first strategy and Chapters 12-15, which are more typical of the second strategy. The main bottlenecks of the first strategy are the selection process of the data and the relevant scale level of analysis for decision-making units and the reliability of the data used. The data gathered under the second strategy are in general better validated but a major drawback is the specificity of the data, which renders generalisation of the conclusions of analysis more difficult

These difficulties are greater in a situation of uncertainty of some of the most basic contextual parameters such as rainfall, market prices, and the political situation. The flexible responses, which are consequently developed by local actors and other decision-making units, further complicate research. One way in which many actors respond is to look for better opportunities to earn a living elsewhere. This means in the first place that, for a statistical analysis, the farm or village level is insufficient and that data at a regional (Chapter 9 and to a lesser extent Chapter 16) and even sub-regional level are needed. The difficulty is to relate this back to the socio-cultural characteristics of the actors involved.

To investigate the role of socio-cultural differences in explaining differential responses to climate variability, the following general research domains can be formulated:

- a description of the major responses developed by local actors to mitigate climate variability and climate change across different agro-ecological regions, focusing on the relationship between rainfall variability, crop and technology choice, on/off-farm resource allocation, and social and cultural factors;
- a description of current trends in order to review potential response reactions (e.g. conditional chances) of different categories of local actors and higher level decision-making units to selected scenarios of climate change;
- a construction of a household typology/stratification based on the analysis of local actors' responses which integrate both quantitative and qualitative dimensions and the integration of this typology into up-to-date simulation models; and
- the creation of a generic methodology, applicable to West Africa, aimed at producing insights for policy makers on the

basis of an analysis of responses by local actors under conditions of climate variability and climate change.

The first two domains were covered by field research and bibliographic surveys focusing on the description of a variety of responses. For these domains, the results of past field research were used (see De Bruijn & Van Dijk 1995, Breusers 1999). In addition, new field research was carried out in relation to a number of selected topics (see below).

The third domain proved the most problematic because it was difficult to come up with sufficient quantitative indicators for a household typology. The range of these indicators within selected clusters of respondents was vast. This was caused by extreme variations in climate, soil properties and other indicators (or a combination thereof) from year to year and even within one year as the result of an intra-seasonal variation of rainfall in time and space in one case-study area. These variations interfered with clustering into specific types. In Koutiala, more quantitative data was available but was concentrated on just one group of actors. Longitudinal data on other groups was not available, so only partial analyses could be made.

The fourth domain was aimed at creating a methodology able to deal with the complexity of the process of construction of responses. This methodology had to differentiate between climate and other physical factors on the one hand and institutional, economic and socio-cultural factors on the other. Given the variability of the main factor to be analysed (climate), some of the other factors involved (markets, political situation), and the complex interaction between the relevant institutional factors, a decision was taken to focus the methodological exercise on decision-making as a process and on individual actors and larger decision-making units. The reason for this was that all the relevant factors to be taken into account converge in the decision-making process.

2.2 Research Activities

Initially the following research activities were planned:

a) an analysis of the quantity and quality of farm household resources and their fluctuations over time (land, water, labour relations and allocation, the households' relations with the institutional and market environment and social and cultural factors);

b) an in-depth analysis of different farm household risk-taking and/or avoidance strategies (implicit time horizon, reference position, relative importance attached to different farm household objectives e.g. food security, reproduction, accumulation, maintenance of resource base, etc.) and the bio-physical, socio-economic, cultural and institutional variables that contribute to the selections of these strategies; and

c) a review of the potential impact of specific scenarios of climate change on the adjustment capacity of resource use and food security.

Field research was envisaged in three areas of the West African Sahel: Kaya in Burkina Faso, and Koutiala and Douentza both in Mali. Later on, Bolgatanga in northern Ghana and Gorom-Gorom in northern Burkina Faso were also added. Reports on the results of these case studies can be found in Chapters 12-15. In this chapter we mainly discuss the contents of Chapter 13 and 14 and consider the results of the case studies in Douentza, Koutiala and Kaya.

Bibliographic Surveys

An analysis of secondary data was made for these three research locations. This analysis was carried out by Mark Breusers for Kaya, and by Han van Dijk for Douentza, both with a broad disciplinary outlook. For Koutiala, Mirjam de Bruijn focused on the anthropological and economic literature.

The main constraint was the availability of literature. For the Douentza sub-region there is little quantitative information on the technical, agro-economic aspects of land use in the region. Furthermore, the northern and western part of the region is quite well described but there is hardly any information on the southern part. In the case of Kaya, the bibliographical survey lacks information on pastoral strategies. Past research in this area focused mainly on the Mossi, who are described in the literature as sedentary agriculturalists, and their survival strategies. There is no data on the mobile and pastoral aspects of the economy and land-use systems in the Koutiala region. In general, anthropological literature on this area concentrates on the sedentary Minyanka (Jonckers 1987, 1995) and is difficult to access.

Field Research

In collaboration with various university departments (the Department of Agronomy and the Department of Tropical Nature Conservation at Wageningen Agricultural University; the Department of Cultural Anthropology at Utrecht University and the Amsterdam Research Centre for Global Issues and Development Studies at the University of Amsterdam), several field research activities were organised. The following projects were carried out:

- land-use strategies by sedentary farmers in Koutiala (2) and Douentza (3) (Nijenhuis 1998, Nikiéma 1999, Maas 2001, Brandts 2002, Griep 2001);
- mobility strategies of semi-nomadic pastoralists around Koutiala (1) (Van Steenbrugge 2001);
- the dynamics of a small rural centre in Douentza (1) (Zondag 2001);
- informal trade systems of cereals in Douentza (1) (Rutgers van der Loeff 2001); and
- vegetation dynamics in Douentza (1) (De Boer 2001).

A PhD project on the dynamics of entitlements to fallow land in Douentza and Koutiala started in 1999 and is still continuing. This project has resulted in several papers (Nijenhuis 2002, forthcoming).

3. PATHWAYS AND HABITUS: TWO CONCEPTS FOR THE ANALYSIS OF DECISION-MAKING IN HIGH-RISK ENVIRONMENTS

3.1 Pathways

The methodology for the analysis of decision-making in high–risk conditions was geared towards analysing the dynamic interaction between individuals and groups and their environment. This methodology, labelled 'pathways', focuses on decision-making. Pathways can be conceptualised as the strategies arising out of the decisions actors, households and groups take in order to deal with all kind of risks in an unstable environment. A pathway is different from a strategy because a pathway is not designed to attain a pre-set goal after a process of conscious and rational weighing-up of the actor's preferences. Instead it arises out of an iterative process in which goals, preferences, resources and means are constantly reassessed in view of new (unstable) conditions with which the decision-maker is confronted. In this process a wide range of past experiences are at the basis of decisions rather than a sharp vision of the future, while these recollections of the past depend to a great extent on the intellectual concerns of present recollections (Ortiz 1980: 80). Knowledge of these unstable conditions and how to deal with them is gathered in an incremental learning process.

The following assumptions underlie the concept of pathways:

- the environment of decision-makers is inherently unstable;
- decision-makers proceed on a step-by-step basis in a high-risk environment and decision-making is an iterative process with the resulting pathway not necessarily having an intrinsically planned or rational character or following a logical order;
- past decisions have to be taken into account because they influence the pathways and the condition of the decision-maker and his/her mental state in the present;
- decisions are made within a specific context by decision-makers with a specific history and a variation in decisions therefore need not to be based on the synchronic attributes such as resource endowments but can also arise from life history; and
- decision-makers coordinate their decisions explicitly and implicitly.

This methodology does not aim to create idiosyncratic descriptions of actors' and collectives' decisions but rather to analyse the dynamics underlying these decisions and to pinpoint the opportunities and constraints which cause a specific type of actor or group of actors to be likely to follow specific pathways to mitigate instability. This may result in the formulation of a number of 'rules of the game', which may be fed into formal decision-making models as treated in other chapters.

In the study of pathways, special attention is given to moments in their evolution when the environment is marked by crisis or a situation of shortage. It is during these periods that we find extremes and an accelerated pace of change in the decision-making strategies of the actors. The options open to actors during these times vary according to the actor but still we expect regularity in options and in decision-making strategies to be detected which relate to the typology of actors according to the varying constellations of their capitals.

A typology of pathways can only be made for the level of the individual or household. Cultural capital appears to have an important influence on the way decisions are taken. People refer to who they are with reference to rules and norms of behaviour. For instance, a cultivator from a Dogon culture will consider different aspects of his habitus when deciding whether or not to use new technologies than a cultivator within a Fulbe cultural environment. The outcome may be the same but in most cases it is not.

Another important element is economic capital which is also used in the linear models developed by economists. It is clear that the possession of tools, money, etc. is very important at a given moment and heavily influences the decision-making process. Another prominent form of capital in the typology is social capital, i.e. social networks, social care relations, labour relations, etc. Knowledge can be an equally important capital. These capitals define the access people have to social and ecological resources and to institutions. They also define perceptions of the environment. A Dogon cultivator with a long history in the region and who sees him/herself as an autochthon will have a different outlook to a cultivator who was once captured as a slave by the Fulbe.

3.2 Habitus

The data requirements for an analysis of pathways are enormous. A strict application of the concept would compel us to assess an actor's perspectives and attributes, amounting to an enormous number of relevant contextual variables, and the social and cultural factors involved at any moment in time. Therefore, we need an intermediate concept to economise on data and one that can be used to link up 'pathways' to contextual factors.

This intermediate concept is labelled 'habitus' to denote the habitual aspects of many of the concepts, devices and perspectives local actors

have and use to interact with ecological and other environments. The concept was defined by Bourdieu: 'Systems of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is as principles which generate and organise practices and representations that can be objectively adapted to their outcome without presupposing a conscious aiming at ends or an express mastery of the operations necessary in order to attain them. Objectively "regulated" and "regular" without being in any way the product of being of obedience to rules, they can be collectively orchestrated without being the action of the organizing action of a conductor' (Bourdieu 1990: 53). 'Habitus' can be defined as the way in which the environment is interpreted and used by local actors. Its properties can be abstracted from the decisions they take in dealing with this environment and the opinions they have about it, discourses and the cultural means they develop for reflecting on these properties. The habitus is the sum of 'cultural understandings' of the environment (Croll & Parkin 1992). The habitus is embedded in the institutional environment, creating and reshaping this institutional environment and through this the physical and social environment. The latter in turn define the availability and the nature of social and natural resources and the possible modes of use.

Habitus denotes both the constructed and objectified nature of the socio-cultural devices people use to interact with the environment and the more permanent character of these devices without implying that they are consciously constructed. Only when confronted with an unexpected situation, e.g. a drought, severe flood or other disaster, will it change form and content. These transformations arise out of the most recent interactions, reflections and people's changing opinions of their environment when they attempt to give meanings to the events that caused these changes and the changes in the natural and social resources perceived and used by them.

For instance, perceptions of the environment change drastically because of recurrent drought. Once seen as the basis for existence, climate variability has become a major concern for people who have lost most of their assets. Though the situation may return to normal, the effects of such events may be permanent. The crisis moulds the relations to which people direct their actions. Rules, norms and ideologies change. With respect to Sahelian droughts, the religious community has become more prominent as a focus of solidarity (Niezen 1990, De Bruijn 1994, 1997) and the role of ritual changes (De Bruijn & Van Dijk 1995). Kinship ties and village solidarity become weaker and people retreat to smaller units such as the 'hearthhold' and individual enterprises (De Bruijn 1997, Van Dijk 1994).

3.3 The Decision-Making Unit: Actors and Groups

The decision-making unit or actor that follows a distinct pathway is a self-reflective agent, taking decisions based on the available information in the face of constraining factors and with the assets at his/her disposal. A relevant decision-making unit can be an individual, a family or a household or any other social unit that acts in a corporate manner.

High-risk environments require specific decision-maker dispositions and organisational set-ups to deal effectively with risk and to ensure continuity. All the environmental domains are defined in relation to decision-making units. They become relevant only because of the decisions taken by these units acting upon one or more attributes, functions or roles of a specific environmental domain. While taking these decisions, the relevant characteristics of an environmental domain have to be defined by the decision-making unit. In turn, the decision-making unit changes as a result of its interactions with the environment and has to be defined as a highly flexible unit. The environment itself, as well as its relevant characteristics, is transformed as a result of its interactions with the decision-making units and processes within this environment itself. In order to explain human behaviour in high-risk environments we need to deal with this two-way interaction.

The survival options of each decision-making unit depend on the possibilities a unit has to interact with its environment. This in turn depends on the degree to which a decision-making unit is able to appropriate and/or incorporate and consequently make use of elements from its environment, which then become 'resources' or 'capitals'. The following types of capital can be distinguished: (i) economic capital: access to technology, tools, crop varieties, equipment, knowledge, labour, cattle, land, water, cash etc.; (ii) social capital: social security networks, family, friends, neighbours, marriage relations, village, lineage, composition of the household; (iii) cultural capital: religion, knowledge, skills, educational level; and (iv) political capital: status, ethnic identity, position in local hierarchies, relations with government and development organisations.

3.4 Related Concepts

These concepts can be used in isolation. However, all kinds of related concepts can be employed to differentiate decision-making units and position them in the various contexts in which they operate. The idea that actors take the various forms of capital at their disposal into consideration in the process of decision-making does not seem problematic. However, in the institutional environment, all kinds of constraints exists for specific types of actors when they interact with their environment. People may not be equal players in the various capital markets such as those for land, credit, employment and political support.

They are ranked in hierarchies that influence the range of choices open to them and they may be excluded from certain types of resources and capitals.

These processes of exclusion (or inclusion) have predominantly socio-cultural and political dimensions. They concern, for example, issues of identity (who belongs to a particular group and is therefore entitled to a specific form of capital and who does not) and status (who is expected to perform a given type of labour because he/she is expected to do so on the basis of a specific status). Actors are not necessarily equally predisposed to taking similar decisions when facing similar conditions. Neither are they equally vulnerable to the impact of climate variability and climate change. They occupy different 'risk positions' (cf. Beck 1992).

4. SOME RESULTS

4.1 The Past in the Present

One of the results of the study indicates that there is a certain congruence between ethnicity and social and political status and strategy because ethnic and social groups have already followed a specific pathway in becoming what they are. They have done so under the pressure of past conditions. For example, under the impact of slave raiding by the Fulbe, the Dogon in the Douentza area are organised around a small strip of land located on the Bandiagara escarpment, whereas the Fulbe organised their existence around the possession and management of livestock on the plains.

Once the political situation changed during the colonial period, this division of resources also changed. The Dogon now occupy more and more land on the plains in their search of fertile cropland and organise new villages around this resource. Their strategy is different from the cultivating Riimaybe who are the former slaves of the Fulbe. They stay where they are since they have never owned the land they cultivated. The noble Fulbe owned that land. As a result they still cannot claim land in Fulbe territory because they do not dispose of cultural capital in the form of genealogies (i.e. they cannot say 'this land belongs to my kinsmen'), for they were part of the family of their masters. Instead these Riimaybe organise themselves around new resources such as aid and development initiatives. A similar development can be observed on the Bandiagara plateau, where the Dogon do not have sufficient land. They are also turning to new resources such as labour migration and aid.

Pathways are at least partly shaped by this historical legacy. Even today Fulbe pastoralists tend to decide more often to follow a pathway, in which livestock keeping plays a prominent role. Likewise Minyanka, Mossi and Dogon farmers tend to invest in cereal cultivation as their main subsistence strategy, and Riimaybe pathways are more often marked by a more diversified pathway, going for cereal cultivation in combination with the gathering of wild food grains.

These patterns persist when representatives of these groups decide to move to new contexts. A Mossi farmer does not usually suddenly change from cereal cultivation to livestock keeping when moving to the southwest of Mali. He may, however, adapt his choice of crops, add cash crops such as cotton or other cereals like maize and rice, adopt new technology and may possess a herd of cattle tended by a Fulbe herdsmen. However, he will remain a farmer. Likewise, the Fulbe have a strong preference for occupations related to livestock, such as herding or the livestock trade. They only invest in cultivation and land when they have disposed of their herd.

4.2 Technological Change in Land Use

Under the impact of the droughts of the 1970s and 1980s, the partial recovery of rainfall conditions in the 1990s, the integration of the study regions in the world economy and population growth, tremendous changes have taken place in land-use strategies during the period under study (1960-2000). However, in the sub-regions, changes were very different due to the differences in weight of the various contextual factors. In the Kaya sub-region, population growth coupled with poor soil fertility and declining rainfall have driven Mossi farmers to cultivate heavier soils in the valley bottoms, which were hitherto left uncultivated because of the technological difficulties involved. This development has also had an impact on the strategies of Fulbe pastoralists in the area. With increasing rainfall, the Mossi may be expected to return to their former land on the slopes of the hills that dominate the landscape. Mossi interest in livestock increased during the drought years and many of the cattle they own are entrusted to sometimes impoverished Fulbe herdsmen who, in this way, see their liberty of movement further restricted.

In the Douentza area, rainfall is clearly the most limiting factor for agricultural production. Over the past decades, a technological revolution has occurred in response to the increasing variability in rainfall conditions. Due to the droughts, the number of livestock in the area has declined dramatically. As the manure of these livestock was used to restore soil fertility after cultivation, productivity from cereal cropping has also declined. Dogon farmers and Fulbe herdsmen compensated for this decline by investing in ploughs and animal traction, an innovation that has allowed them to cultivate more land with the same amount of labour. Strangely enough, camels are now being used as draught animals in the north of this sub-region.

In the Koutiala area the main driving force has been a state-run cotton development scheme. This agricultural intensification project has managed to encourage cereal farmers to devote one third of their land to commercial cotton growing. This authoritarian agricultural intensification model worked exceptionally well as long as the cotton prices on the world market guaranteed a profit for the Cotton Company and the farmers, and as long as there was enough wasteland to put into production. The latter was essential because, despite the use of inputs, productivity failed to grow at the same pace as production and profits were being made at the expense of soil fertility. The result has been an almost total transition from hoe to plough-based cropping systems. Small and marginal farmers and villages have, however, been ignored. This success story came to an halt at the end of the 1990s when the cotton price dropped, farm-gate prices were reduced and the financial stability of cotton development came under threat. Rampant corruption at all levels of the organisation also played a part in this downturn of fortunes.

For each of the areas, there seem to be critical factors of a political, economic and climatic nature that shape decision-making strategies with respect to land use. In the Douentza area, declining rainfall might become the most critical factor. Cereal cultivation here is at the margins of feasibility. A further deterioration in average rainfall and an increase in its irregularity might drastically reduce the production potential of the region and induce numerous people to opt for something else in the future. A similar reasoning might be envisaged in the growing of cotton in the northern parts of the Koutiala area.

For the Kaya area, the story is somewhat more complicated given its intermediate position and the possibility of substituting one kind of land for another. Both modern and endogenous technological innovations can be observed. However, the evidence of improvements in productivity is contested. The increase in productivity cannot be directly attributed to the changes observed and relatively few investments are being made to improve the performance of local cropping systems. Local farmers and herdsmen do not invest in landed resources but rather in capital that can be moved from one location to another, such as livestock or social capital in the form of access rights to land in a variety of locations (see also below). Other factors such as rainfall patterns, the increase in livestock numbers and the relative importance of infields versus outfields might be more important factors on which the observed increases in productivity are based.

4.3 Control over Resources

Maintaining control over resources is pivotal to the continuity of a decision-making unit and for the pathway it follows. It is clear that units that have preferential access to land in a specific area are more inclined to invest in a land-based strategy such as the cultivation of cereals and

cash crops. These units are in general more sedentary than others. Poor households of Dogon are moving to the south (Nijenhuis forthcoming) and individuals from the Kaya area who do not belong to the core lineages of villages and are at the bottom of the pile when land is being distributed often decide to move to other areas where land is still available. In the past, they moved into areas in the Kaya zone which are less densely populated. Nowadays they are moving to the southwest of Burkina Faso and Côte d'Ivoire where population densities are relatively low and agro-ecological conditions are better.

Likewise, control over cattle is an important factor in understanding the development of pathways of livestock-keeping Fulbe families. When they have control over their cattle they are more inclined to engage in small-scale movements in their home areas to look for the best pasture and watering areas and the optimal place to market livestock products (milk). When not involved with livestock they devote themselves to cereal cultivation and tend to live an economically marginal existence in the northern Sahel or a socially marginal existence in the southern areas (the Sudan) where the conditions for cultivation are better. Alternatively, they may end up as wandering paupers, relying on temporary activities such as guarding someone else's herd, wage labour and/or religious services.

The case studies also show the importance of non-material resources and social capital in the form of social relations that enable people to access specific types of labour, support and income. Cultural and political capital, such as religious knowledge or affiliation to specific status groups may have material consequences in the form of access to land and/or access to sources of income in the form of gifts and/or payment for specific services rendered. Affiliation with the founding lineage of a village or belonging to the autochthonous lineages is still an important criterion for gaining access to land. The position of 'strangers' is by definition much weaker. In Douentza, members of the noble groups among the Fulbe remain in firm control of the land whereas the Riimaybe are still extremely dependent on the nobles.

4.4 Population Movements

Mobility is not only a part of daily life and a form of crisis management. It has always been an integral feature of life in unstable West African climatic conditions as the prime strategy for coping with instability (Adepoju 1995). The history of the Mossi, for instance, is marked by the expansion of their kingdoms (often they are still considered aggressive expanders), and by forced labour migration to Côte d'Ivoire. The history of the Dogon is one of expansion in the 20th century with the pacification of the area by the colonial powers. The Fulbe herdsmen have a specific history of movement and are regarded all over West Africa as the people who come from elsewhere, as strangers.

An analysis of these histories and actual patterns of movement have shown that the conclusion Gallais (1975) drew, based on the pre-drought situation, that people in the Sahel and Sudan have to move to earn a living to accommodate climate variability is still valid. The events during the drought years of the 1970s and 1980s only confirmed this, although new patterns of activities have emerged. Current trends in population mobility will certainly become more articulated with increasing climate variability and climate change and this will have far-reaching consequences for policy formulation and recent trends in urbanisation and population growth in more southerly areas.

In all the studies undertaken, mobility emerges as an important aspect of people's pathways. This aspect of life goes way beyond an individual level and may be designated a group strategy. Being mobile has various causes, among which climate change, variations in rainfall and conflict appear as the most important. Mobility refers not only to the population of the areas themselves but also to others migrating to the study areas. These movements have all kinds of consequences in the area from which people originate and in the regions to which they migrate. Migration to a specific place may channel the movements of those who decide to move later. For example, people from the same ethnic background and even from the same micro-unit (village, lineage) tend to cluster in specific places.

The consequences for those who remain behind depend on the characteristics of the people who migrate. For Fulbe women, the elderly and children, the massive outflow of young men, coupled with the failure of these migrants to contribute substantially to the welfare of their dependants who remain behind, is a severe problem (see De Bruijn 1998). Among the Dogon and Mossi, ties with the migrants remain close and their decision-making units may more aptly be called multi-spatial livelihoods (cf. Foeken & Owuor 2001).

The form this mobility takes and the way it is used depend on the personal characteristics underlying a specific pathway and the perception of the environment as comprised in the habitus. For instance herdsmen perceive their environment as food for their animals and behave accordingly. For them, transhumance is an important part of their mobility. And if their usual transhumance routes are no longer accessible – maybe because of drought – they will search for another option. This has led in the Douentza area to a shift of transhumance towards the west (in the Seeno to the west of the Daande Seeno and from the Bandiagara plateau to the Inner Delta of the Niger).

Another important strategy for nomadic people is to flee the regions where they anticipate problems, i.e. conflicts or drought. They simply move to the south. Their perception of the ecological environment is much more as a space to feed their animals than as a space to produce. Cultivators will appropriate and exploit their environment with the idea of settlement in mind and are mobile if mobility serves this objective.

Nevertheless, the Mossi and Dogon also have their rural seasonal migrations. They move to locations in which they expect to obtain better results. This is, however, limited and is related to their political position (dominance over other groups) and to the availability of open space. In the southern research area, Koutiala, it was clear that this way of exploiting the environment had come to an end. There, even the herders (who often came from the north) had no further possibilities to move freely with their cattle, leading them to flee to relatively empty zones in the border region between Mali and Burkina Faso.

Exceptional conditions lead to more articulated forms of population mobility. An on-going development that can be currently observed and which can be attributed to climate change or at least to successive drought years, is the expansion of the Dogon and Mossi towards the south and within their home areas. Coupled with the introduction of the plough and camel or oxen traction, they are able to occupy more land as a consequence. This process started in the northern areas of Douentza and Kaya but the same pattern is now apparent in the southern area of Koutiala.

Mobility also links the different agro-ecological zones in which the various case studies were carried out. It appears that the geographical borders drawn around these areas had nothing to do with social borders or ethnic relations. This linkage between the regions could even be seen as multi-spatial land use and production units. Access to various natural resources in different agro-ecological zones is crucial for the survival of some families and individuals. They are individually mobile between the zones, or they spread different family members over the zones to assure the survival of the family. Mossi, for example, try to maintain rights of access to agricultural land in various climate zones, using an elaborate kinship network. In this way they can play with rainfall conditions and adapt their farming strategies to various phases in their life cycle. Concrete examples of this were studied among Fulbe herdsmen and Dogon cultivators (Steenbrugge 2001, Brandts 2002). One can also find examples of Mossi and Fulbe outside their home area co-habiting with Senoufo and other ethnic groups in the southwest of Burkina Faso.

In their search for land Dogon tend to become more mobile while the Fulbe, in their search for cereals, tend to become less mobile (since their principal source of labour, the Riimaybe, have disappeared). Likewise, the Mossi frequently move their fields and compounds, both within and beyond village boundaries. Mossi are moreover heavily involved in long-distance migration to Côte d'Ivoire where over the last thirty years a shift in their main occupation can be observed from mostly wage labour to more entrepreneurial activities (e.g. share croppers, cocoa or coffee plantation owners). Others from all groups tend to go into non-agricultural activities (wage labour, trade).

Urban migration has received relatively little attention in this study (see Chapter 16 this volume). For Dogon and Mossi cultivators,

migration to towns is a seasonal activity, accepted as an alternative way of earning additional income. Fulbe herdsmen may also move to towns. However, for them, the town is a last resort, only to be considered if their main resource (their herd) is depleted.

Finally at the opposite end of the scale is sedentarity The studies done for this project show that both mobility and sedentarity are a reaction to the same changing circumstances. Technological change may lead to the settlement of herding people who are adopting similar technologies to the Dogon and Mossi. The Riimaybe, the former slaves of the Fulbe, have become less mobile as a reaction to climate changes. They have become active in appropriating development projects propagated by non-governmental organisations (NGOs), which has stabilised village life for them.

4.5 Diversification

Trade

One of the most interesting aspects of the changes over the last 40 years is the enormous increase in the amount of trade and the number of people (partly) dependent on this activity. The town of Douentza has, in particular, changed from a dusty administrative centre into a lively market town. The area has also become an important transit route between cereal-producing areas in the south and the cereal-deficit areas to the north. In the Douentza area this has given rise to a big increase in the number of small millet traders based in the villages. This evolution has been promoted by the liberalisation of the cereal trade, the introduction of donkey carts, the end of political unrest in the north of Mali and the availability of capital from wage labour in town and abroad. Personal characteristics of people engaging in trade are very important, for example whether or not they use their capital to buy a donkey cart or to invest in merchandise, and whether there is someone at home to replace them during periods of prolonged absence.

In Koutiala, trade is certainly booming, though less so than in Douentza. Here, imported goods have acquired a certain importance as people seek to spend the money they have earned from growing cotton. Even more importantly, earnings are being invested in livestock. The cotton-growing zone has become the main area for rearing cattle in Mali. Cattle are a good investment and fit into the farmers' strategies of doing something about declining soil fertility. However, little is known about who manages and owns the cattle presently in the area, and for what purposes their products are used.

In Kaya, trade is less obvious. Incomes are not as high as in Koutiala in Mali and the need to trade is less urgent than in Douentza since large numbers of people have settled in other areas. The ties maintained with these people often serve as the basis for alternative sources of income, or for acquiring access to other resources.

Wage Labour and Services

Though trade is also a poor man or woman's occupation as a coping mechanism, wage labour is one of the principal forms of crisis management. The diversity and forms of wage labour are too numerous to discuss here in full. At the local level, wage labour plays a limited role. Sometimes poor people work for others on the land during the rainy season. However, in general the possibilities for earning a wage in one's home area are limited, especially in Douentza and Kaya. This is not only due to a lack of employment but also because labour shortages are often covered by exchange between individuals and households.

People have been going to towns and to other countries to look for work since the colonial era. The period of time people are away ranges from a couple of weeks to several years without interruption. Earnings from wage labour are mainly used for consumption purposes, for example, to solve the cereal gap after a bad harvest. Direct investments in agricultural equipment are limited to oxen or camel teams and donkey carts, which can also be used for trade.

The kinds of activities and their locations vary enormously between ethnic and status groups but also within these groups depending on gender, age, knowledge and status. Social networks play an important role as they often provide entry to specific activities. A distinction must also be made between people who remain in the countryside and those who move to town. Young Fulbe herdsmen, for example, often take up salaried herding in the south of Mali, northern Côte d'Ivoire or southwest Burkina Faso. They may also settle and become agricultural migrants. Among the Dogon and Mossi this kind of rural-rural migration is quite common, though these groups are not looking for work with livestock but for work on the land. In areas like Koutiala with its cotton industry, the prospects for employment are somewhat better than in other areas. Not surprisingly, many Fulbe and Dogon from Douentza and Bandiagara can be found in Koutiala.

Cultural preferences also play an important role in the choice of labour. The Fulbe avoid manual labour as far as possible and stick to herding and trade. Dogon and lower status individuals from Fulbe society are much less sensitive in this respect. There has been a striking increase in the participation of women in temporary migration, for example as domestic servants for rich people in town and among the Mossi they join their husbands in agricultural enterprises in Côte d'Ivoire.

The delivery of services like healing and counselling is also a way of earning an income. The Fulbe, for example, are regarded as Islamic clerics by non-Islamic groups and are reputed to be potent healers with the help of Koranic texts. The Dogon have a reputation for being skilful herbal healers and are often consulted in their home areas as well as further afield.

4.6 Habitus, Institutional Change

Another question is, of course, what happened to the institutional environment in relation to climate variability and economic policy and political changes at higher levels and whether these institutions have been affected by the evolution of the pathways as sketched above. In the first place such an analysis must distinguish between effects caused by global and national economic and political change and those related to on-site (i.e. regional and local) factors. For reasons of space we limit ourselves here to the habitus as perceived by the local people. Higher order changes have been treated in Breusers (2002), Van Dijk (forthcoming) and Brons *et al.* (Chapter 16 this volume).

A major institutional change that has had a great impact on the construction of pathways concerns social relations, especially relations between generations. Among all the groups studied for the micro-level studies it is noticeable that the younger generations make different use of the opportunities offered by the outside world and have developed a different perspective on their future. For them, their careers are not limited to farming or herding. Instead they orient themselves towards wider social, economic and ecological environments. They clearly perceive the need for outside income and have different ambitions in terms of employment and consumption but also in social relations and their view of the world. Strikingly, education is not seen as a way of realising these ambitions, at least not by most of those originating from the countryside.

The role of patron-client relations is changing. For example, in the past the Dogon were subordinated to the Fulbe but now impoverished Fulbe herdsmen are becoming the clients of Dogon cattle owners and if they migrate to the south, of Minyanka and urban cattle owners. The Riimaybe are increasingly gaining independence as they move to town and acquire independent sources of income, whereas their patrons are becoming increasingly impoverished.

Though no research was conducted in this domain, these changes have certainly been promoted by the amount of information available about the outside world by means of modern communications such as (local) radio, telephone, television, which is penetrating the countryside, and the experiences of returning migrants. Better and cheaper means of transport and improved infrastructure have also helped to open up people's worlds.

Thirdly, the ways in which resources are being appropriated and distributed through society have changed enormously. As a result of droughts, property relations with respect to livestock have changed fundamentally, making it less attractive for young people to remain in the livestock economy. There is increased competition over land and water due to growing scarcity but changes in land use have also promoted these changes as well as the fact that an ever-increasing

number of people are settling or establishing production units outside their home areas. Administrative interventions, the decentralisation of administrative power, environmental and land-use planning projects, legal reforms of land tenure and forest management have opened up opportunities for local people to use other means of acquiring access to resources. As a result, tenure systems have hardened and the number of conflicts has increased.

Fourthly, the image of the state has changed fundamentally. From an oppressive all-powerful colonial state and its successor, it has changed into a weak, corrupt bureaucracy. The credibility and legitimacy of the state is declining, a development that has gained momentum with structural adjustment programmes. Administrative decentralisation and democratisation have not repaired the damage because these changes have only confirmed the image of weakness and have primarily promoted the decentralisation and democratisation of corruption, while not (yet) having led to the full participation of the population in politics. Informal political hierarchies have remained largely intact. State influence differs dramatically across the study areas, from a quite active (and in the past activist) state in Kaya to a weak bureaucracy in Douentza, and to the tight control of the para-statal cotton development company (CMDT) in Koutiala.

Fifthly, an important change has occurred in the way that urban areas and small rural centres are perceived. They are naturally the centres for all kinds of commercial activities, which are increasing in number at an amazing speed. At the same time they are the nodes for the exchange of all the kinds of information mentioned above. The dynamics of these centres are perceptible even in the most remote corners of the study areas though the impact on the economy is not yet being felt in the more inaccessible places.

The increase in the number of NGOs in the region is an effect of the semi-arid climate and its variations. The droughts of the 1970s and 1980s attracted a large number of aid agencies (bilateral, multilateral, NGOs) to the Sahel. A strange kind of symbiosis has developed between the development sector and target populations. In some cases the courting of aid agencies has developed into a substantial aspect of a household's income-earning activities, as described in some cases of dam building on the Bandiagara plateau (Van Beek & Peters 1999). In some Riimaybe villages a sequence of projects is providing a substantial part of the income of the population in the form of food for work, salaried jobs and the like, whereas no substantial improvement of income-earning capacity can be observed. Part of the reaction of aid agencies can be related to the specific position of their target populations. The Riimaybe present themselves as former slaves and thus as hard-working people (also in their own cultural definition). The Dogon on the rocky Bandiagara plateau are famous for their artwork and seem to be engaged in a heroic fight to survive in their unfriendly ecosystem as a result of tremendous

physical effort. Development agents see them as such and therefore like working with them.

Lastly, perhaps the most important innovation is the way in which social relations are used over distance. As we have seen, mobility is one of the most important characteristics of strategies to accommodate change. This has led to an enormous broadening of the life-world of Sahelian populations. There is hardly any individual who does not have a distantly related kinsman living somewhere beyond his/her immediate surroundings. This geographical expansion of the habitus and the new meaning and content that are given to these kinship relations are extremely important for an understanding of the evolution of pathways. Hardly any research has been carried out into this domain.

4.7 Pathways

Though individual pathways are extremely varied and are almost unique inventions by individuals, families and higher-level social organisations, some general patterns can be detected in the three research areas and a characterisation of pathways can be made. This typology will naturally not be exhaustive and no claim can be made that these pathway types will be the most dominant in the future as the conditions under which they have evolved may change rapidly. Pathways also have a dynamic of their own and as we will see some are dead-end streets and will disappear over time when conditions are (un)favourable. Several activities may be combined simultaneously or sequentially as options open up or disappear.

A pathway evolves over time as a combination of contextual factors, the way in which the social actors perceive these factors (habitus) and the cultural and psychological predispositions and assets owned by the actor. In addition it is clear that there is a considerable degree of chance, arising from variations in climatic and economic conditions. An evaluation of pathways and decision-making by actors and other decision-making units needs, therefore, to be carefully evaluated against the background of all these factors.

A classification of pathways must distinguish first between those that are more and those that are less mobile, though the degree of mobility may change in the course of their evolution. Cultural predispositions may provide part of the explanation for the amount of mobility and the choice of activities. Fulbe herdsmen tend to be more mobile than farming Riimaybe, Dogon and Mossi, though the Kaya case study clearly shows that this distinction is not watertight. Likewise, people with a herding background tend to refrain from manual labour and opt for herding, trade, and services. People from a farming background seem to invest more in access rights to landed resources than people with a herding background. Urban pathways are present in both groups.

Another distinction must be made between winners and losers. One must not forget that the people we observe today are those who have survived, in other words have been able to cope with climate variability, drought, and economic trends. Closer inspection of impoverishment pathways reveals that the difference between failure and success is often minimal. Several cases discussed in De Bruijn & Van Dijk (2001) and Breusers (2002) show this all too clearly, with some ending in extreme poverty, chronic illness sometimes with psychological origins, psychological problems and even an untimely death (Chapter 13 and 14 this volume).

Another important feature of the evolution of pathways is the emergence of what has been labelled multi-spatial livelihoods (Foeken & Owuor 2001). Risks are not only spread through a diversification of activities but also by geographically dispersing the members of decision-making units. Mossi farmers in particular, as well as representatives of other ethnic groups, have created complex livelihoods where the boundaries of the decision-making unit or livelihood are sometimes difficult to draw because people are moving around the various parts of the unit in a very flexible manner. The multi-spatial units formed in this way can be quite large and are based on a variety of social relations, of which kinship remains the most important.

This extension of pathways over multiple locations seems to run counter to another observed trend, namely, the increasing fragmentation of decision-making units. However, this contradiction is only apparent. Fragmentation indeed occurs in most places under the impact of problems related to climate variability and the ensuring of survival. The departure of members of decision-making units causes a lot of this fragmentation. Moreover it seems that risk avoidance puts a premium on investing in small-scale units because of the co-variance of the consequences of climate events (the case of drought in Douentza) and market fluctuations (the case of cotton in Koutiala).

4.8 Conclusion

The studies on decision-making have made it clear that wide-ranging factors have to be taken into consideration when investigating pathways of specific individuals and groups. Studies of decision-making tend to be limited to on-site variables such as land, availability in the household and personal assets. The circles of relevant spaces have to be extended enormously. The variables taken into account by decision-makers cover a far wider range than the household or the village or even the district, By following people from one area to another, a more complete analysis can be made of responses to climate variability and possible reactions to climate change.

Since the research executed within this sub-project was limited to a small number of settings and social groups, it is obvious that not all the

underlying patterns have emerged at this stage. More carefully contextualised and focused field research is needed to make up for this lack of data. Economic data will have to be built into these efforts from the start but the integration of socio-cultural and economic approaches can only be successful when non-linear elements are incorporated into simulation models and wider sets of data covering not only on-site conditions can be used.

People make use of a variety of resources and networks to earn an income and to survive calamities. Choices made about undertaking a particular activity are never permanent. People shift regularly from one activity to another in a variety of locations. Pinpointing who chooses which pathways and under which conditions is important for any projection of people's responses to climate variability and climate change. The methodology has demonstrated its ability to make more sensitive analyses of these processes of decision-making. It has to be supplemented by more quantitative assessments of the economic behaviour of people, and more basic and original data gathering and field research. The linkages between the individual level and higher order phenomena at village, regional and national levels still require more attention.

PART C

CONSEQUENCES FOR POLICY